CLAIMS

I CLAIM:

1. A hoist for positioning a load, comprising:

a plurality of hydraulic hoist cylinders each coupled at one end to the hoist and at an opposite end to the load at a lifting point;

a plurality of position sensors, each associated with one of the hoist cylinders and operable to provide position data for the associated hoist cylinder;

a plurality of electronically controlled valves hydraulically coupled to the hoist cylinders for extending and retracting the associated hoist cylinders;

a user input device operable by a user to specify load data; and

a hoist controller operable to receive the load data from the input device and the position data from the position sensors and in response thereto to control the electronically controlled valves so as to position the load according to the load data.

2. The hoist of claim 1, wherein the load data comprises at least one of user instructions associated with load movements, load material, load geometry, and lifting point geometry.

3. The hoist of claim 1, further comprising a center member coupled to the hoist cylinders.

4. The hoist of claim 3, wherein the center member comprises a hook.

5. The hoist of claim 4, wherein the center member comprises a frame.

6. The hoist of claim 1, wherein the hoist controller is operable to translate a desired movement of a reference point defined on the load by the load data to a position change of at least one of the hoist cylinders to effectuate the desired movement.

7. The hoist of claim 1, wherein the load data defines a geometric relationship between the lifting points and the reference point, and the hoist controller is operable to determine the position change based on the geometric relationship.

8. The hoist of claim 1, further comprising a rotary coupling coupled to the hoist and operable to rotate the load about a vertical axis.

9. The hoist of claim 8, wherein the rotary coupling is hydraulically operable and hydraulically coupled to the hoist controller, and the hoist controller operable to control a rotational position of the rotary coupling.

10. The hoist of claim 3, wherein the center member extends from a cable, and the hoist further comprises a deflection sensor operable to measure a deflection of the cable.

11. The hoist of claim 10, wherein the hoist controller is coupled to the deflection sensor and operable to control a position of at least one of the hoist cylinders as a function of the deflection.

12. The hoist of claim 1, further comprising a load sensor associated with each of the hoist cylinders to generate loading data, the hoist controller being coupled to the load sensor to receive the loading data.

13. The hoist of claim 12, wherein the load sensor comprises at least one of a load sensing cell and a pressure transducer.

14. The hoist of claim 12, wherein the hoist controller is operable to store at least one loading limit and compare the loading limit to the loading data to identify an overload alert condition.

15. The hoist of claim 14, wherein the hoist controller is operable to change a position of at least one of the hoist cylinders responsive to identifying the overload alert condition.

16. The hoist of claim 12, wherein the hoist controller is operable to determine a center of gravity of the load based on the loading data.

17. The hoist of claim 1, wherein the plurality of hoist cylinders comprise at least four hoist cylinders.

18. A lifting system for positioning a load, comprising:

a lifting device;

a plurality of hydraulic hoist cylinders each supported at one end by the lifting device and at an opposite end to the load at a lifting point;

a plurality of position sensors, each associated with one of the hoist cylinders and operable to provide position data for the associated hoist cylinder;

a plurality of electronically controlled valves hydraulically coupled to the hoist cylinders for extending and retracting the associated hoist cylinders;

a user input device operable by a user to specify load data; and

a hoist controller operable to receive the load data from the input device and the position data from the position sensors and in response thereto to control the electronically controlled valves so as to position the load according to the load data